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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,388	04/15/2004	Victor Blakemore Slaughter	7784-000947	8461

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EXAMINER	
CHACKO DAVIS, DABORAH	
ART UNIT	**PAPER NUMBER**
1756	

MAIL DATE	DELIVERY MODE
10/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/825,388	SLAUGHTER, VICTOR BLAKEMORE	
	Examiner	Art Unit	
	Daborah Chacko-Davis	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-11 and 13-21* is/are pending in the application.

4a) Of the above claim(s) *18-21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2,4-11,13-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 20, 2007, has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 4, 6-7,10, 13, and 16, are rejected under 35 U.S.C. 102(b) as being anticipated by U. S. Patent Application Publication No. 2002/0197869 (Nakagawa et al., hereinafter referred to as Nakagawa) in view of U. S. Patent No. 4,015,986 (Paal et al., hereinafter referred to as Paal).

Nakagawa, in the abstract, in [0010], [0011], [0014], [0018], [0019], [0022], [0024], [0051], [0052], [0053], [0056], [0057], [0060], [0063], [0064], [0065], [0072], [0074], [0076], [0077], [0078], [0084], [0090], discloses immersing (submersing) an exposed resist coated substrate (cured resin, exposed resist-coated substrate is subjected to stripping) in a stripping bath (storage device containing liquid) thereby the

substrate is submersed in the stripping liquid, said resist-coated substrate undergoing a stripping process in the stripping treatment bath, wherein the bath includes a stripping liquid (water-based) that strips the resist from the substrate resulting in an increase in the concentration of the resist in the resist stripping liquid; the increase in dissolved resists increases the concentration of the degraded components in the resist stripping liquid causing the ratio of the amount of degraded components to the amount of the stripping liquid to increase (i.e., resist stripping rate drops), also causing a change in the electrical conductivity (electrical characteristics) of the water-based stripping liquid; measuring the electrical conductivity, using an electrical conductivity meter, of the resist stripping liquid along with the degraded components in the treatment adjusting bath to ascertain the degraded component concentration in the liquid; replenishing (replacing the used resist stripping liquid with unused stripping liquid) the stripping treatment bath with fresh stripping liquid (by controlling inflow and outflow of the fresh liquid and used liquid with corresponding control valves) when electrical conductivity measurements indicate that the degradation limit (dissolved resin exceeds a desired range) value has been exceeded, and thereby restoring the resist stripping performance of the resist stripping liquid (claims 1, 4, 6-7, 10, 13, and 16).

The difference between the claims and Nakagawa is that Nakagawa does not disclose that the submersion of the resist coated substrate (resin coated object) is in the liquid in the storage device (liquid in the bath).

Paal, in col 4, lines 7-15, in col 5, lines 3-40, discloses that the substrate with the photoresist is immersed in a solution in the tank (container)

Therefore, it would be obvious to a skilled artisan to modify Nakagawa by immersing the substrate in the solution in the container as taught by Paal because Paal, in col 6, lines 46-68, and in col 7, lines 1-3, discloses that the photoresist coated substrates that were subjected to stripping by immersing in the solution in a tank for a predetermined time resulted in a substrate surface that was completely clean (from photoresist residues) and unstained, and the quality of the substrate surface from which the photoresist had been removed remained excellent.

4. Claims 2, 5, and 11, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent Application Publication no. 2002/0197869 (Nakagawa et al., hereinafter referred to as Nakagawa) in view of U. S. Patent No. 4,015,986 (Paal et al., hereinafter referred to as Paal) as applied to claims 1, 4, 6-7,10, 13, and 16, above and further in view of U. S. Patent No. 6,368,421 (Oberlander et al., hereinafter referred to as Oberlander).

Nakagawa in view of Paal is discussed in paragraph no. 3.

Nakagawa, in [0002], [0004], and [0005], discloses that after the resist (resin) is exposed to light (exposed portions of the resist is cured), the exposed resist is subjected to resist stripping process. Nakagawa, in [0051], discloses that the stripping liquid is a glycol ether type solvent.

The difference between the claims and Nakagawa in view of Paal is that Nakagawa in view of Paal does not disclose using laser to form a cured resin portion on the object (substrate coated with the resist) (claims 2, and 11). Nakagawa in view of

Paal does not disclose that the glycol ether solvent is a tripropylene glycol methyl ether (claim 5).

Oberlander, in col 5, lines 35-44, discloses that laser radiation is used for performing exposure on the photoresist coated substrate (curing the photoresist). Oberlander, in col 3, lines 30-39, discloses that the resist stripping solution is a glycol ether type solvent such as tripropyleneglycolmethylether.

Therefore, it would be obvious to a skilled artisan to modify Nakagawa in view of Paal by employing the solvent suggested by Oberlander because Oberlander in col 3, lines 30-40, and in col 6, lines 20-28, discloses that the suggested solvent is a non-corrosive stripper for photoresists and organic residues and is easily miscible with water and has a boiling point greater than 60°C, and thereby suitable for minimal heating. It would be obvious to a skilled artisan to modify Nakagawa in view of Paal by using laser to cure resin as suggested by Oberlander because Oberlander, in col 5, lines 40-45, discloses that any actinic radiation including laser can be used to perform exposure on the resist layer and Nakagawa, in [0004], discloses that the resist is irradiated (cured) by performing exposure to light.

5. Claims 8-9, 14-15, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent Application Publication No. 2002/0197869 (Nakagawa et al., hereinafter referred to as Nakagawa) in view of U. S. Patent No. 4,015,986 (Paal et al., hereinafter referred to as Paal) as applied to claims 1, 4, 6-7,10, 13, and 16, above and further in view of U. S. Patent Application Publication No. 2004/0160225 (Kung).

Nakagawa in view of Paal is discussed in paragraph no. 3.

Nakagawa, in [0014], [0022], [0023], [0076], [0082], discloses that the electrical conductivity meter measures the changes in the electrical conductivity based on the increase in the ratio of the degraded component concentration of the resist residues to the concentration of the resist stripping liquid.

The difference between the claims and Nakagawa in view of Paal is that Nakagawa in view of Paal does not disclose indicating ranges of the ratio via illumination and non-illumination of at least one light-emitting diode (claims 8, and 14). Nakagawa in view of Paal does not disclose indicating at least three different ranges of the ratio via illumination and non-illumination of the at least two light-emitting diodes (claims 9, and 15).

Kung, in [0034], and in [0035], discloses using LED's (three) to visually indicate at least three ranges of electrical conductivity measurements.

Therefore, it would be obvious to a skilled artisan to modify Nakagawa in view of Paal by replacing the conductivity meter with LED's as suggested by Kung because Kung, in [0009], discloses that an LED can be used in place of a meter and in [0034], discloses that using more than one LED's enable the indication of the different conductivity levels such as good, low, or bad using the LED's corresponding colors of green, amber and red respectively.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent Application Publication no. 2002/0197869 (Nakagawa et al., hereinafter referred to as Nakagawa) in view of U. S. Patent No. 4,015,986 (Paal et al., hereinafter referred

to as Paal) and U. S. Patent No. 6,368,421 (Oberlander et al., hereinafter referred to as Oberlander).

Nakagawa, in the abstract, in [0002], [0004], [0005], [0010], [0011], [0014], [0018], [0019], [0022], [0024], [0051], [0052], [0053], [0056], [0057], [0060], [0063], [0064], [0065], [0072], [0074], [0076], [0077], [0078], [0084], [0090], discloses immersing (submersing) an exposed resist coated substrate (the exposed novolak resin is exposed to light to form a cured resin, exposed resist-coated substrate is subjected to stripping) in a stripping bath (storage device containing liquid) thereby the substrate is submersed in the stripping liquid such as glycol ether type solvent, said resist-coated substrate undergoing a stripping process in the stripping treatment bath, wherein the bath includes a stripping liquid that strips the resist from the substrate resulting in an increase in the concentration of the resist (solute) in the resist stripping liquid (solvent); the increase in dissolved resists increases the concentration of the degraded components (solute) in the resist stripping liquid (solvent) causing the ratio of the amount of degraded components to the amount of the stripping liquid to increase, also causing a change in the electrical conductivity (electrical characteristics) of the water-based stripping liquid; measuring the electrical conductivity, using an electrical conductivity meter, of the resist stripping liquid along with the degraded components in the treatment adjusting bath to ascertain the degraded component concentration in the liquid (claim 17).

The difference between the claims and Nakagawa is that Nakagawa does not disclose using laser to form the cured resin portion on the object (substrate coated with

the resist). Nakagawa does not disclose that the glycol ether type solvent is a tripropylene glycol methyl ether. Nakagawa does not disclose that the submersion of the resist coated substrate (resin coated object) is in the liquid in the storage device (liquid in the bath).

Paal, in col 4, lines 7-15, in col 5, lines 3-40, discloses that the substrate with the photoresist is immersed in a solution in the tank (container).

The difference between the claims and Nakagawa in view of Paal is that Nakagawa in view of Paal does not disclose using laser to form the cured resin portion on the object (substrate coated with the resist). Nakagawa in view of Paal does not disclose that the glycol ether type solvent is a tripropylene glycol methyl ether.

Oberlander, in col 5, lines 35-44, discloses that laser radiation is used for performing exposure on the photoresist coated substrate (curing the photoresist). Oberlander, in col 3, lines 30-39, discloses that the resist stripping solution is a glycol ether type solvent such as tripropyleneglycolmethylether.

Therefore, it would be obvious to a skilled artisan to modify Nakagawa by immersing the substrate in the solution in the container as taught by Paal because Paal, in col 6, lines 46-68, and in col 7, lines 1-3, discloses that the photoresist coated substrates that were subjected to stripping by immersing in the solution for a predetermined time resulted in a substrate surface that was completely clean (from photoresist residues) and unstained, and the quality of the substrate surface from which the photoresist had been removed remained excellent. It would be obvious to a skilled artisan to modify Nakagawa in view of Paal by employing the solvent suggested by

Oberlander because Oberlander in col 3, lines 30-40, and in col 6, lines 20-28, discloses that the suggested solvent is a non-corrosive stripper for photoresists and organic residues and is easily miscible with water and has a boiling point greater than 60°C, and thereby suitable for minimal heating. It would be obvious to a skilled artisan to modify Nakagawa in view of Paal by using laser to cure resin as suggested by Oberlander because Oberlander, in col 5, lines 40-45, discloses that any actinic radiation including laser can be used to perform exposure on the resist layer and Nakagawa, in [0004], discloses that the resist is irradiated (cured) by performing exposure to light.

Response to Arguments

7. Applicant's arguments, in regards to claims 1-2, 4-11, 13-17, filed July 20, 2007, have been fully considered and are persuasive. The 102 rejection made in the previous office action (paper no. 20070131) has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U. S. Patent No. 4,015,986 (Paal et al., hereinafter referred to as Paal).

A) Applicants argue that Nakagawa does not disclose submersing the object in the liquid in the storage device.

Nakagawa teaches filling the resist stripping chamber hood, that has the substrate to be stripped positioned on the conveyor, with resist stripping liquid to a desired level via the sprayer, and therefore the substrate (object) is submersed in the resist stripping liquid applied. However, Paal is depended upon to disclose immersing

(submersing) the photoresist coated substrate in a liquid in a tank (storage device). See paragraph no. 3.

B) Applicants argue that modifying the Nakagawa to include submerging would change the principle of operation of Nakagawa.

Modifying Nakagawa by submerging the photoresist coated substrate in the liquid in the tank taught by Paal does not change the principle operation of Nakagawa because Nakagawa, in [0066], discloses that measurement of the concentration of the water content in the resist striping liquid, the measurement of the degraded component of the degraded component, and the liquid level measurement in the bath are independent of one another and Nakagawa, in [0083], discloses that an overflowing of the liquid above the liquid level is not a problem.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd

September 28, 2007.